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ABSTRACT

An investigation was made of the effectiveness of the teacher education curriculum for primary school mathematics teachers in Tanzania. Subjects were a random sample of 8 teacher trainees in each of 4 selected colleges, as well as 4 school principals, 12 tutors, and 16 serving teachers. Data were gathered by means of questionnaires and observations. Results showed that colleges in Tanzania do not have a prescribed mathematics textbook. It was also indicated that topics such as probability, number bases (other than base 10), and intersection and union of sets should be dropped or taught with very little emphasis and that topics such as equations and business arithmetic should be added to the present syllabus. Results indicate that a review of the existing college mathematics syllabus is necessary. Other observations showed that mathematics teachers in primary schools used very few teaching aids, class textbooks were available, and subject matter was fairly well understood by pupils. The poor mathematics background of the teacher trainees was noted by all respondents, and block teaching practice during the first and second year of teacher training was recommended. Samples of the research instruments are appended. (JD)

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in Curriculum Development & Evaluation

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LAURENT ANATOLY MASOTA:

INVESTIGATION OF THE EFFECTIVENESS OF TEACHER-EDUCATION CURRICULUM IN PRIMARY SCHOOL MATHEMATICS IN TANZANIA MAINLAND

1982

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INVESTIGATION OF THE EFFECTIVENESS OF TEACHER-EDUCATION CURRICULUM IN PRIMARY SCHOOL MATHEMATICS IN TANZANIA MAINLAND

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1982

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ABSTRACT

This study was on investigation of the effectiveness of Teacher-Education Curriculum in Primary School Mathematics in Tanzania Mainland. The purpose of the study was to survey the effectiveness of the primary mathematics programme in the Teachers' Colleges with a view of identifying areas of strengths and weaknesses in the methods and instructional materials used.

The investigation involved mathematics tutors teacher-trainees in the final year, serving teachers and Teachers' College Principals. Four colleges were in the sample and 4 Principals, 12 tutors, 16 serving teachers and 32 teacher-trainees filled in questionnaires.

The results from the questionnaires showed that:

a. Colleges do not have a prescribed Mathematics Textbook.

b. Topics, such as, Probability, Number Bases other than Base Ten, Intersection and Union of sets and Rigid Motions should be dropped and if not should be taught with very little emphasis.

c. Topics, such as, Standardizing Examination marks, Equations and Business Arithmetic should be added to the present syllabus.

d. A review of the existing College Mathematics Syllabus was necessary.

The four Principals, and the teacher-trainees recommended strongly the idea of having Block Teaching Practice during the first year and the second year of teacher-training. The Mathematics tutors remarked the poor mathematics background in teacher-trainees and so did the teacher-trainees themselves. The serving teachers and the teacher-trainees said pre-service training was useful in preparing them to teach mathematics in primary schools.

The Observation Schedule showed that :

a. Mathematics teachers in primary schools used very little teaching aids.

b. Class textbooks were available.

c. Matter taught was fairly understood by pupils.

CHAPTER ONE

STATEMENT OF THE PROBLEM

A. Background to the Study:

Tanzania has two categories of primary school teachers. These are Grade A teachers and Grade C teachers. Grade A teachers are secondary school leavers who undergo a two-year residential teacher-training course. Grade C teachers are elementary school leavers who receive a three-year teacher-training course. Some of the Grade C teachers get their training in Teachers' Colleges, while others undergo their training outside the colleges. The latter receive most of their training through ward or Zonal primary school co-ordinators who are assisted by primary Education inspectors. The latter type of training costs less because it is mostly non-residential. It was introduced to help in meeting the demand for teachers in the implementation of the "Musoma Resolution", a resolution which was passed by the ruling political party, TANGANYIKA AFRICAN NATIONAL UNION (TANU), in 1974, for Universal Primary Education (UPE) in Tanzania by 1979.[1]

In Tanzania, the objective of primary school teacher-education curriculum[2] is to produce dedicated and capable teachers who are able to give primary school children permanent ability in literacy; emphasis being placed on the three 'R's', that is Reading, Writing and Arithmetic. In Arithmetic it is a strong desire of both the parents and the Society that primary school pupils should acquire the basic skills and numeracy. For a long time now, however, children's ability in computations has shown great deficiencies.

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1. From: Basic Facts about Education in Tanzania (1980) Ministry of National Education Document.

2. Basic Facts about Education in Tanzania (1980) page 4 and page 5.

B. The Problem:

In view of the continuous outcries expressed in local newspapers and in other mass media by both the parents and educational administrators on the ineffectiveness of mathematics teaching at primary level the need to evaluate the existing teacher-education curriculum in relation to primary school Mathematics programme is a matter of national concern. This evaluation was to find out:

1. The present situation in Teachers' College Curruculum as regards content of Teachers' College Mathematics in relation to primary mathematics, methods and techniques of learning.
2. How effective is that curriculum in the teaching of mathematics in primary schools.
3. Ways of reviewing the existing mathematics programme for effective teaching.

The purpose of evaluating the present situation would be to obtain more systematic and reliable information on the mathematics programme in Teachers' Colleges. The result would be a base-line information for evaluating the impact of future operations of the programme. The essential elements evaluated in the programme were:

a. The level of training of the teachers to teach mathematics;
b. The appropriateness of primary mathematics syllabus and instructional materials in Teachers' Colleges.
c. The mathematics background of the teacher-trainees so as to establish, how much input in terms of training is required;
d. Attitudes of tutors, teacher-trainees and serving teachers on Mathematics,
e. The effectiveness of mathematics curriculum in teacher-education programme.

C. Purpose of the Study:

This study concerned itself with an investigation into the implementation of the Teacher-Education Curriculum in Primary Mathematics in Tanzania Mainland. It, therefore, sought answers to the following questions:

1. Are there any mathematics instructional materials in the Teachers' Colleges?
2. Are those materials, if any, accessible to the students?
3. How appropriate are the instructional materials?
4. Do the Colleges give appropriate emphasis on the teaching aids preparation?
5. Are students thoroughly familiarized with primary schools mathematics textbooks?
6. Do primary school pupils assimilate mathematics topics taught by their teachers?

D. Significance of the Study:

In Educational Planning the need for alternative ways of teaching is much emphasized. Educational research as a method of obtaining findings for alternative ways is advocated by many educationists. The result of this survey, therefore, would be of great significance in the country, especially in the improvement of Teacher-Education Curriculum in Primary School Mathematics since:

1. Suggested teaching aids and techniques would contribute to the effectiveness of the curriculum.
2. Suggested instructional materials would make classroom mathematics learning livelier and interesting.
3. Findings on strengths and weaknesses in teaching mathematics would help in providing Teachers' Colleges with information to improve the professional competencies of teachers in Primary Mathematics.
4. Suggested instructional materials and teaching techniques would help curriculum developers in reviewing the existing syllabus and textbooks.

E. Definitions of Terms:

The following are definitions of some of the terms that were used in the study:

INSTRUCTIONAL MATERIALS OR AIDS: Any materials that help in the teaching. If they help the child in his learning skills they are learning aids. If they facilitate the teacher's instruction, they are referred to as teaching aids.

EFFECTIVENESS: This is the degree of success in imparting or absorbing matter or concept during the learning process. This is the impact of instruction on the learner.

IMPACT: This is the long-time effect of instruction or learning process on the learner.

TEACHERS' COLLEGES: These are known as "Colleges of National Education" in Tanzania. They are institutions where students undergo their teacher training courses.

WARD OR ZONAL PRIMARY SCHOOL CO-ORDINATORS: These are long-experienced primary school teachers, who for their capability and compentency, are stationed in wards and zones as primary school education advisers in their respective areas. They are sometimes referred to as Universal Primary Education (UPE) teacher-trainers (UPE TUTORS).

STRATEGIES: These are methods and techniques employed in teaching to facilitate or accelerate the acquisitions of the desired learning outcomes.

TEACHER-TRAINEES: These are student teachers in Teachers' Colleges.

CHAPTER TWO

REVIEW OF LITERATURE

The purpose of this section is to give some background to the problem under study. In formulating the background the researcher looked into changes in the mathematics curriculum, like the introduction of new contents and subsequent implication in the teaching strategies. The fundamental part of the background to the study lies in the changes due to new policies, pronouncements, planning and administration within the nation and especially in the teaching profession.

Background to the Problem:

In Tanzania, the last twenty years have seen in many subjects, a re-examination of the content of school courses, methods of teaching and of changes in syllabuces. In Mathematics (the subject under study), new topics, such as set-theory, probability theory and statistics have been introduced. Such topics have created a lot of confusion particularly in the minds of most parents who never had such content during their school days and indeed strong criticism and dissatisfaction on these new topics have been heard.[3]

The problem with curriculum as a field of inquiry, however, is the absence of a consistent theory. Changes in the primary school mathematics had to occur and they are going to inevitably take place since curriculum development is a continuous process. The changes that occured in the primary mathematics have also been reflected in the Teacher-Training Programme. However, these changes at Teacher-Training level have had a slightly different outlook. Emphasis in the Colleges has always been placed on the methods of teaching that resulted from studies of how children learn mathematics. In those methods children have to learn by doing, discussing mathematics and solving problems, while the job of the teacher is to help in developing this discovery attitude. Tanzania Teacher-Education Mathematics Programme has, therefore, the following objectives:[4]

1. To introduce student teachers to new concepts in Mathematics.

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3. Mathematics Panel Urgent Meeting in 1977 in Moshi was held as a response on people's outcries of Mathematics Content in Primary Schools.

4. Teacher-Education Primary Mathematics Syllabus (1975) Ministry of National Education.

2. To prepare and encourage student teachers so that during their teaching they emphasis discovery methods, encourage their pupils to learn by doing and to motivate them to like the subject through use of teaching aids.

3. To make student teachers appreciate the importance of speed and accuracy in doing mental sums.

Efforts in implementing these objectives are being made. Unfortunately most find the subject-matter strange and unusual and as such, they induce a negative attitude to the student teachers towards the subject.

This view is observed by Muze:

> "Not all mathematics teachers have an equally solid background in modern topics and techniques. —— Mathematics is a very important subject in our institutions in Tanzania, but it is probably the worst taught subject in schools and hence most hated subject by a large number of students."[5]

Lack of competent mathematics teachers and tutors in our educational institutions is a problem facing developing countries. Renes[6], in one of his surveys in Indonesia, observed the critical shortage of competent Science and mathematics teachers in primary schools and was of the opinion that this shortage of teachers could mainly be attributed to the tendency of the more intellectually gifted youngsters to avoid teaching and choose the more prestigeous professions.

One other reason which makes competent mathematics teachers in the primary schools less effective in their teaching has been the enormous expansion of primary education. This accelerated expansion of primary education in Tanzania to cater for the Universal Primary Education has led to the increased number of primary school input and this has led to the problem of a high pupil-teacher ratio. Tables 1 and 2 below indicate this information. The problem of high pupil-teacher ratio threatens the whole purpose of discovery learning.

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5. Muze M.S. "The Editorial," Mathematics Association of Tanzania Bulletin, Volume 10 No. 1 June, 1975.

6. Renes. In his survey on shortage of competent Science and Mathematics teachers in Indonesia (1965).

TABLE 1

Primary School Enrolment in Tanzania 1969 - 1975

YEAR	STANDARD ONE	STANDARD SEVEN
1969	157,906	60,790
1970	172,576	65,624
1971	190,091	70,502
1972	208,331	88,656
1973	226,071	103,807
1974	231,706	152,686
1975	431,165	Not given

Source: Ministry of Economic Affairs and Development Planning. Economic Survey; 1974/1975.

TABLE 2

Primary School Teacher-pupil ratio, 1969 - 1975

Year	Number of Teachers	Teacher-pupil ratio
1969	16,577	1: 46.7
1970	17,790	1: 46.5
1971	19,876	1: 45.4
1972	20,938	1: 48.9
1973	23,168	1: 47.7
1974	25,400	1: 52.3
1975	29,874	1: 53.2

Source: Ministry of Economic Affairs and Development Planning. Economic Survey 1974/1975.

It would seem appropriate, therefore, to begin thinking seriously about the discipline which has the theory and practice of mathematics teaching as its research field, and teacher-education as its decisive field of application.[7]

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7. Some extracts from a paper on comparative study of the Development of Mathematics Education as a Professional Discipline in Different Contries (1979) by Schubring Bielefeld.

CHAPTER THREE

DESIGN OF THE STUDY

A. Sampling procedures:

The target population consisted of all teacher-trainees in 18 Teachers' Colleges. Because it was impossible, due to limited time and transport, to take a random sample of all the Colleges, the survey was carried out in four Teachers' Colleges which were situated near the researcher's place of work. Each of those four Colleges trains students on Grade A certificates.

In each of those four colleges a random sample of 8 Grade A teacher-trainees all in the final year, was selected for the study. Since each Teachers' College has a primary school situated close to it, a random sample of 4 serving teachers was taken. The primary school for that purpose was the one specially chosen by each college in the sample for its teaching practice purposes. The School is often referred to as a practising School. Most of the teachers in each practising school are ex-students of the College to which the school is attached.

The teacher-trainees and the serving teachers were selected randomly Numbers were assigned to all teacher-trainees in the final year and to all serving teachers in each practising school.

Pieces of paper bearing the different numbers in each category were used. Then 8 or 4 respondents were picked from each category in each college. The Luck-dip Method for Selection was applied. This was done by putting all the pieces of paper with numbers assigned to each piece of paper into a basket. Then a piece of paper representing a respondent was picked randomly by the researcher at a time after shaking the basket. The sample for the study was, therefore, as indicated in Table 3 below:

TABLE 3

Size of the Sample

Name of College	Teacher-Trainees GRADE A	Serving Teachers GRADES A OR C	Total
D'SALAAM	8	4	12
KLERRUU	8	4	12
MKWAWA	8	4	12
MOROGORO	8	4	12
TOTAL	32	16	48

The sample also consisted of all mathematics tutors and all the principals in the four Colleges.

For observation purposes the serving teachers who were observed teaching were any two teachers in each Practising school of the College already selected as indicated in table 3 above. The same method of random sampling as described above was used. The sample for observation purposes was as indicated below in Table 4.

TABLE 4

Sample for Observation

PRACTISING SCHOOL ATTACHED TO NAME OF COLLEGE	OBSERVATION SERVING TEACHERS GRADE A OR GRADE C	TOTAL
DAR ES SALAAM	2	2
KLERRUU	2	2
MKWAWA	2	2
MOROGORO	2	2
TOTAL	8	8

B. Data Collection Instruments:

The instruments consisted of four types of questionnaires and an observation schedule. One questionnaire was for all the Principals of the Teachers' Colleges in the study, another was for all the mathematics tutors and the third for the teacher-trainees in the Teachers' Colleges for the study. The fourth questionnaire was for the serving teachers working in practising schools situated close to colleges in the sample. The questionnaire for the serving teachers and for the teacher-trainees were very similar. They tested three major aspects, namely:

1. Instructional materials as regards to quality and appropriateness
2. Methodology and/or teaching techniques for effective teaching of skills planned for the programme.
3. Attitudes towards mathematics and the mathematics programme.

The observation guideline was used for class teaching. This was used in determining whether the mathematics topics taught to the pupils were assimilated by the pupils. It could as well have shown if teaching aids were used by the serving teachers, and were used by the serving teachers, and whether the Teacher-Education Curriculum in the primary mathematics was relevant. Table 5 below outlines briefly the instrumentation process.

TABLE 5

Framework for the Instrumentation Process

What to evaluate	By whom	Instrument	Purpose
1. Syllabus and Instructional materials	Researcher Principals Mathematics Tutors Students Serving teachers	Questionnaire Nos. 1, 2, 3 and 4	1. To diagnose strong and weak areas in the College Mathematics Syllabus and Mathematics Instructional materials 2. To provide data for reviewing the syllabus.
2. Students' Mathematics Background	Tutors and Students	Questionnaires Nos. 1, 2 and 3	1. To diagnose poor areas. 2. To suggest ways of improvement
3. Attitudes of Tutors Teacher-trainees and serving teachers towards Mathematics	Researcher	Attitude Scales in Questionnaires Nos. 1, 2 and 30	To obtain the respondents' attitudes towards Mathematics
4. Level of training and teaching competency	Researcher	Observation Schedule	To assess success or otherwise, of the preparation of primary mathematics teachers.

C. Administration of the Instruments

The instruments were administered by the researcher. Prior to his visits to the Colleges in the sample, he obtained an official letter from the Ministry of National Education, Teacher-Education Division, which was the letter of introduction to all the Principal of the Teachers' Colleges in the study. The researcher also sent, well in advance, questionnaires No. 1 - for the Mathematics Tutors and No. 4 for the Principals. Since these were self-explanatory the researcher asked the relevant respondents to fill in the required information well abead of the researcher's visit to each college in the sample.

During his visit to each college in July, 1982 the researcher administered the Teacher-Trainees' questionnaire, and the serving teachers' questionnaire. He also did the observation of lessons.

CHAPTER FOUR
ANALYSIS OF DATA

The analysis of the data obtained was done mainly by adding up frequencies of similar responses in each questionnaire and then calculating percentages of the responses. Comparison and contrast were done on percentage basis. Much of the information was condensed in tables. The following is a brief report on the collected data analysis.

Questionnaire No. 1 was for all the Mathematics Tutors in the selected Teachers' Colleges. 12 tutors filled in the questionnaire. 10 (83.3 percent) of all the respondents were male and 2 (16.7 percent) were female. Table 6 below indicates further information on the tutors' classification according to qualifications. Figures in brackets are percentages which were calculated on 12 respondents.

TABLE 6

Tutors' Qualifications

College	Tutors' Qualifications			
	Grade C	Grade A	Diploma	Graduate
Dar es Salaam			1 (8.3)	
Klerruu	-	-	3 (25)	B.Sc. (Maths) 1 (8.3)
Mkwawa	-	1(8.3)	-	B.Sc. (Maths) 3 (25)
Morogoro	-	-	2 (16.7	B.Sc. (Maths) 1 (8.3)
Total	-	1(8.3)	6 (50)	5 (41.7)

Tutors' Teaching Experience and Subject Speciality: 7 (58.3 percent) of all the twelve respondents said they had taught for over 5 years, 4 (33.3 percent) had taught for 3 to 5 years and 1(8.4 percent) had taught for not more than 2 years. The respondents further indicated that 7 (58.3 percent) of them had 3 to 5 years of Mathematics teaching in Teachers' Colleges, 3(25 percent) had taught mathematics in colleges for not more than 3 years and 2 (16.7 percent) said they had taught mathematics in colleges for more than 5 years. All the twelve mathematics tutors indicated mathematics as their subject speciality.

College Mathematics text-books:

As regards a mathematics textbook for the students, 9(75 percent) of all the twelve respondents said there was no textbook and 3(25 percent) indicated to have a textbook.

Mathematics Reference books:

The respondents said they used a number of mathematics reference books. Table 7 shows the titles of reference books. Against each title is the number of respondents and percentages, who indicated the books.

TABLE 7

Mathematics Reference Books used by Tutors.

Title of Book	Respondents N = 12
1. Basic Concepts of Mathematics Entebbe Series	8 (66.7)
2. Hesabu za Tanzania 1 - VII (Primary Mathematics Books)	10 (83.3)
3. Secondary Mathematics 1 - IV Tanzania	8 (66.7)
4. Kitabu cha Hesabu kwa Walimu (Primary School Mathematics Handbook)	9 (75)
5. Others	6 (50)

"Hesabu za Tanzania 1 - VII" which are primary mathematics textbooks are used much as reference books. The "Kitabu cha Hesabu kwa Walimu" is the next popular book. All the respondents gave almost similar reasons for using the reference books given in Table 7. The books contained most of the mathematics topics in the College Mathematics Syllabus.

Familiarizing the students with the content of the primary mathematics textbook was another item in the questionnaire. 10 (83.3 percent) of all the respondents said that the students were familiarized with the topics and 2 (16.7 percent) said they had no time for that.

Syllabus Content: 9 (75 percent) of all the respondent suggested no topic to add to or drop from the existing College Mathematics Syllabus and 3 (25 percent) suggested to drop the following topics:

Probability

Number Bases, other than Base ten

Rigid Motions (Translation, Rotation and Reflection)

The three respondents further suggested to add the following topics:

Equations (Simultaneous and Quadratic Equations)

Statistics

Teaching aids:

The tutors reported that the Colleges offered little time for the preparation of teaching aids. Local materials were being used in making teaching aids and the aids prepared were used during Block Teaching Practice, Single Lesson Teaching Practice and during Micro-teaching Practice.

Tutors' attitudes towards Mathematics:

The tutors attitudes towards mathematics revealed the information summarized in Table 8 below. Figures outside the brackets represent the number of the respondents with the some feeling, while those in brackets are percentages. Note that SA Stands for Strongly Agree, A for Agree, U for Undecided, D for Disagree and SD for Strongly Disagree.

TABLE 8

Tutors' Attitudes towards Mathematics

STATEMENT	SA	A	U	D	SD	TOTAL
1. The Instructional Materials in the Teacher-Education Curriculum in Primary Mathematics are appropriate.	1(8.3)	8(66.7)	2(16.7)	1(8.3)	-	12(100)
2. The Mathematics Course in the Colleges should allot more time for familiarizing the students with the contents of primary class textbooks.	4(33.3)	5(42.7)	-	2(16.7)	1(8.3)	12(100)
3. To build up more confidence in the students more periods on the College Timetable should be given to Mathematics	5(41.7)	2(16.7)	3(25)	1(8.3)	1(8.3)	12(100)
4. More emphasis should be given to mental sums	1(8.3)	4(33.3)	2(16.7)	4(33.3)	1(8.3)	12(99.9)

Attitude item 1 was most acceptable. 9(75.0 percent) of all the twelve respondents agreed with it. Item 4 was fairly taken. An equal number of the respondents appeared on both sides of "Undecided"

Students Mathematics academic ability.

The twelve tutors rated their Grade A Students' academic ability as follows: 9(75 percent) indicated "average" and 3(25 percent) of the respondents rates the students academic ability, "poor."

Report on the contents of the existing Teachers' College Mathematics Syllabus showed that 10(83.3 percent) of the respondents rated the contents as "good for the two-year period" and 2(16.7 percent) of the tutors said it was "extensive for the two-year period."

Students' Personal information

Questionnaire No.2 involved 32 teacher-trainees. Of the 32 respondents, 17(53.13 percent) were females and 15(46.87 percent) were males. The item about subject speciality or the subject each respondent specialized together, with other subjects revealed the information outlined in Table 9 below.

TABLE 9

Subject Speciality Grouping

Subject	Respondents	Percentage
Mathematics	11	34.38
Languages	5	15.63
Political Science (Siasa)	5	15.63
Geography	2	6.25
Handicraft	2	6.25
No subject speciality	7	21.88
TOTAL	32	100.02

Instructional Materials and Teaching Aids

College Mathematics Text-books

24 (75 percent) of all the respondents indicated that there was not a prescribed Mathematics Textbook and that Mathematics tutors were using a number of reference books for their lectures. However, 8(25 percent) respondents said there was a textbook "Kitabu cha Hesabu kwa Walimu" in use.

This book is the Kiswahili version for "The Teachers' Handbook for Primary School Mathematics, Entebbe Mathematics Series, 1966.

Table 10 below gives a list of mathematics reference books used by students in the Colleges. Percentages are calculated on the basis of 32 respondents for each book.

TABLE 10

Mathematics Reference Books used by Teacher-Trainees

Title of Book	Respondents N= 32	Percentages
1. Kitabu cha Hesabu kwa Walimu	16	50.00
2. Hesabu za Tanzania Primary 1 - VII	17	53.13
3. Secondary Mathematics 1 - IV (Tanzania	15	46.88
4. Additional Mathematics Entebbe Series 1 - II	10	31.25
5. Advanced Mathematics Entebbe Series I - II	8	25.00

Familiarizing students with Primary Mathematics Textbooks

The item on having all the primary school mathematics textbook familiarized to the students during the course revealed the information given in Table 11.

TABLE 11

Familiarization of Primary Mathematics Textbooks to Teacher-trainees.

Familiarized	Respondents	Percentages
YES	22	68.75
NO	10	31.25
TOTAL	32	100

The table indicates that primary school mathematics textbooks are fairly well studied through in the colleges.

Syllabus Content

The item on which topics could be dropped from or topics which could be added to the existing mathematics syllabus gave out the following information. Percentages were calculated on 32 respondents.

TABLE 12

Topics to be added to or dropped from the Syllabus
(Teacher-trainees' opinion)

Topics to be added	Respondents	%	Topics to be dropped	Respondents	%
1. Business Arithmetic	6	18.75	1. Probability	10	31.25
2. Statistics Standardization of Exam. marks	4	12.5	2. Number Bases other than Base Ten	12	37.5
3. Simultaneous Equations	6	18.75	3. Sets and Venn Diagrams	10	31.25
4. Functions	5	15.625	4. Quadratic Equations	5	15.625

Table 12 indicated that Business Arithmetic and Simultaneous Equations were topics which 6 respondents for each topic said that these topics should be added to the existing Syllabus. Other topics to be added to the Syllabus were statistics and Functions. The table also shows that Probability, Number Bases, Sets and Venn Diagrams were topics to be dropped from the present Syllabus.

Teaching Aids Preparation:

16(50 percent) of all the respondents said that the Colleges had allocated time for the preparation of teaching aids in a week. The other 16 (50 percent) respondents said they did not have time for the preparation of teaching aids.

Block Teaching Practice:

24 (75 percent) of all the respondents expressed the need of having Block Teaching Practice during each year of Training.

Teacher-Trainees' Attitudes towards Mathematics

The Attitude Test items brought out the information indicated in Table 13. Figures in brackets show percentages. Note also that SA stands for Strongly Agree, A for Agree, U for Undecided, D for Disagree and SD for Strongly Disagree.

TABLE 13

Teacher Trainees' Attitude towards Mathematics

STATEMENT	SA	A	U	D	SD	TOTAL
1. Your College Mathematics Course broadens your knowledge beyond your Secondary or Primary School Mathematics	4(12.5)	10(31.25)	4(12.5)	5(15.65)	9(28.125)	32(100)
2. You find your College Mathematics Course preparing you more for primary school mathematics teaching (methodology) than giving you academic background.	9(28.120)	14(43.75)	3(9.375)	2(6.25)	4(12.5)	32(100)
3. You find your College Mathematics course preparing you both in methodology and in broadening your academic knowledge for primary school mathematics teaching.	15(46.875)	9(28.125)	4(12.5)	2(6.25)	2(6.25)	32(100)
4. After your 2-year mathematics learning in the College you feel well prepared for teaching mathematics in primary schools.	14(43.75)	9(28.125)	4(12.5)	3(9.375)	2(6.25)	32(100)
5. The present College Mathematics Programme is too long for the 2-year teaching period.	5(15.625)	6(18.75)	6(18.75)	5(15.625)	10(31.25)	32(100)
6. Mathematics is your favourite subject in your College.	8(25)	9(28.125)	6(18.75)	5(15.625)	4(12.5)	32(100)

Table 13 indicates that Attitude items 2, 3, 4 and 6 were each acceptable to more than half of the thirty-two respondents. Attitude item 1 showed average acceptance. Against this item there is an equal number of respondents on either side of "Undecided." Attitude item 5 showed below average acceptance.

Teacher-Trainees' Mathematics performance:

The thirty-two respondents rated themselves in overall performance in their college mathematics lessons and examinations. This revealed that 18(58.25 percent) of the respondents said they were average and 4(12.5 percent) said they were very good at Mathematics. As regards College Mathematics lessons, 20(62.5) said the lessons were interesting, 8(25percent said they were usually interesting and four indicated that the lesson were never interesting.

Tutors' Ability to teach Mathematics:

The respondents rated their mathematics tutors' ability to teach. 14(43.75 percent) rated the tutors' ability as "good," 10(31.25 percent) rated it "very good" and 6(18.75 percent) said it was "average."

Serving Teachers' Personal information:

Questionnaire No.3 was filled in by 16 serving teachers teaching in practising primary schools. The respondents were 11 women and 5 men. 10 respondents were Grade A teachers and 6 were Grade C teachers. 8(50 percent) of all the respondents had teaching experience of not less than 5 years and had taught mathematics in primary schools for not more than 5 years. 10 (62.5 percent) of all the respondents indicated that their subject speciality was Mathematics. All the respondents except 2(12.5 percent) had not less than 7 mathematics teaching periods in a week.

Primary School Class Textbook:

On Mathematics class textbooks, all the sixteen (100 percent) respondents said that the books were available and that their teaching was facilitated by the availability of the class textbooks. However the respondents indicated they did not have time enough to prepare teaching aids in the subject. 15(93.75 percent) of all the respondents said that their teaching ~~word~~ load was big since, besides teaching mathematics, they were teachers of other primary school subjects.

Usefulness of the Mathematics Course in Colleges:

As regards the usefulness of the mathematics course, the respondents underwent during their pre-service training in their colleges, 14(87.5 percen.) of all the respondents said that the course was quite useful. However 4(25 percent) of the respondents suggested topics such as Probability theory, Number Bases other than Base Ten, Symmetry and Set theory should be dropped from the existing syllabus.

Serving Teachers' Attitude towards Mathematics:

The Attitude test items which were similar in form to those given to the teacher-trainees in this study, brought out the information shown in Table 14 below. Figures in brackets show percentages. Note that SA stands for Strongly Agree, A for Agree, U for Undecided, D for Disagree and SD for Strongly Disagree.

TABLE 14

Serving Teachers' Attitude towards Mathematics

STATEMENT	SA	A	U	D	SD	TOTAL
1. Your College Mathematics Course broadened your knowledge beyond your Secondary or Primary School Mathematics.	4(25)	7(43.75)	2(12.5)	3(18.75)	-	16(100)
2. You found your College Mathematics Course preparing you more for primary school mathematics teaching (methodology) than giving you academic background.	7(43.75)	5(31.25)	1(6.25)	3(18.75)	-	16(100)
3. You found your College Mathematics Course preparing you more both in methodology and broadening your academic knowledge for primary school mathematics teaching.	5(31.25)	7(43.75)	-	4(25)	-	16(100)
4. After your 2-year mathematics learning in the College you felt well prepared for teaching mathematics in primary schools.	6(37.5)	7(43.75)	2(12.5)	1(6.25)	-	16(100)
5. The existing College mathematics Syllabus is too long for the two-year training.	2(12.5)	2(12.5)	6(37.5)	6(37.5)	-	16(100)
6. Mathematics was your favourite subject in your College.	3(18.75)	8(50)	3(18.75)	2(12.5)	-	16(100)

The table indicates that all the Attitude items, except item 5, were each acceptable to most of the respondents. Attitude item 5 was the only one which 12 respondents out of 16 indicated "Undecided" or "Disagree."

Serving Teachers' Ratings:

The sixteen serving teachers rated themselves on the overall performance in their College Mathematics lessons and examinations. 9(56.25 percent) indicated "good," 5(31.25 percent) "average" and 2(12.5 percent) respondents said "very good." They also rated their college lessons. 7(43.75 percent) of the respondents said the lessons were "often interesting," 6(37.5 percent) indicated "usually interesting" and 3(18.75 per cent) said "rarely interesting." The serving teachers also rated their mathematics tutors' ability to teach. 8(50 per cent) said it was "good," 6(37.5 percent) said "very good" and 2(12.5 per cent) indicated "the best."

Principals' Reports:

Questionnaire No. 4 was filled in by 4 principals from the Teachers' Colleges selected for this exercise. The principals reported on their mathematics tutors' qualifications. Table 6 gives the qualifications of the twelve mathematics tutors in the study.

The four principals said that the tutors' teaching load was fair and that each tutor had time to prepare his leactures. However, the respondents expressed the need for more mathematics tutors. On the qualities of a mathematics tutor they said he should be academically and professionally competent in the subject.

The principals further indicated that the content of the existing College mathematics syllabus was adequate for the two-year training period. They remarked, however, that this content was mainly of a secondary school aspect. It was too academic. They suggested to make the Syllabus more professional. The respondents recommended that statistics (standardizing marks) Equations (simultaveous and Quadratic) and Business Arithmetic should be added to the present mathematics syllabus. Probability, Venn Diagrams, Rigid Motions (Translation, Rotation, Reflection), and Number Bases other than Base Ten should be dropped from the syllabus.

The principals called for an immediate review of the college mathematics syllabus.

The respondents also stressed the need for Block Teaching Practice during the first and second year of teacher-training.

The Observation Schedule:

To obtain information on pupil/teacher interaction during lessons, teaching aids and teaching techniques, and on pupils' assimilation of topics taught, it was necessary for the researcher to observe 8 serving teachers teaching mathematics in primary school classes. Eight teaching periods were attended and a prepared observation schedule was used in the assesement of each teacher who was observed teaching. The Schedule had ten different items to be observed and each item had five specific things or points which were used in awarding the aggregate grade against each item. An outline of the findings is given in Table 15 below. Figures in brackets are percentages.

TABLE 15

Teaching Assessment Analysis

Items for Observation	Grade to award				
	1	2	3	4	5
1. Lesson Notes Plan	-	-	3(37.5)	5(62.5)	-
2. Knowledge of Subject-matter	-	-	-	2(25)	6(75)
3. Ability to teach	-	-	2(25)	4(50)	2(25)
4. Self-expression	-	-	1(12.5)	6(75)	1(12.5)
5. Blackboard work	-	1(12.5)	2(25)	3(37.5)	2(25)
6. Pupil/teacher relationship	-	-	2(25)	4(50)	2(25)
7. Class Discipline	-	-	1(12.5)	5(62.5)	2(25)
8. Use of Teaching Aids	-	5(62.5)	2(25)	1(12.5)	-
9. Pupils' assimilation of topics taught	-	-	3(37.5)	3(37.5)	2(25)
10. Adequacy of given exercises.	-	-	-	5(62.5)	3(37.5)

Table 15 indicates that item 2(knowledge of subject-matter) and item 10 (Adequacy of given exercises) were very well attended to by all the eight teacher who were observed teaching. For item 2 all these eight teachers were each awarded a grade greater than 3, and for item 10 each got 4 or 5. On item 8 (Use of Teaching Aids), 5 of all eight observed teachers were each awarded 2. This indicates the non-use of teaching aids during mathematics lessons. This situation, however, agrees with their opinion that teachers have too much to attend to and have thus very little time or no time to prepare teaching aids.

On the whole Table 15 shows satisfactory mathematics teaching in primary schools. This also reflects the effectiveness of Teacher-Education Curriculum in Primary School Mathematics Programme.

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

In this chapter an attempt has been made to draw out conclusions based on the data presented in various tables and other findings from the interpretations of the data collected. Recommendations made refer to the data of this research or to derived information from the collected data and from previous researchers and literature.

Primary School College Mathematics Syllabus:

It is noted nearly from all the respondents, including the four Principals from the sample of Teachers' Colleges, that the wish of having the ~~Sl~~ Syllabus reviewed was clearly spelt out. There were some reasons mentioned and these were the following:

1. Some of the topics in the existing College Mathematics Syllabus are irrelevant to the needs of the pupils, if not, they are of no immediate use for the pupils those topics are intended for. Such topics included Probability, Number Bases (other than Base ten), Venn diagrams involving union or intersection of more than two Sets and Rigid Motions.
2. It was expressed by the respondents that the existing college syllabus was too academic and it was suggested to make the syllabus more professional. Much of the syllabus content should, therefore, be made to emphasize the methodology aspect and more time of the course should be spent on this aspect.
3. Some topics, not included in the present Mathematics Syllabus should be added. These are Business Arithmetic, Statistics, Simultaneous Equations and Functions.

While it is accepted that Base Numeration other than Base Ten may help the students become more competent in base ten numeration, findings have not always proved successful, since teacher-trainees have always treated the topic as a separate entity. It is thus recommended that presentation of number bases other than base ten should be treated with less emphasis.

Mathematics Background:

It is recommended that some research should be conducted to discover ways and techniques by which teacher-trainees with a poor mathematics background could be provided with the necessary requirements to build up their competencies in the subject.

College Mathematics Textbook:

It was indicated by nearly all the respondents in the study that Colleges do not have a prescribed Mathematics Textbook. There is, therefore, a need to prepare one. The book would certainly facilitate mathematics teaching in the Colleges. It would, in the meantime, save the mathematics tutors from the uncertainty of obtaining information on the topics given in the College Mathematics Syllabus. This textbook, moreover, would contain a number of mathematics topics which would provide the teacher-trainee with ample chance to strengthen his ability in the subject.

The book ought to cater for two-fold teacher-education programme. Besides providing academic competency in Mathematics, it should, as well, show a variety of techniques in the teaching. The book should, therefore, be academically and professionally appropriate for teacher-education.

Teaching Aids:

It was revealed from the survey that most Teachers' Colleges allot very little time or no time for teaching aids preparations. The observed lessons further proved the idea that most of the serving teachers do teach using little or no teaching aids. It should be understood that teaching aids are a means of making a lesson successful if appropriately and properly used. They facilitate the teaching process. It is recommended, therefore, Teachers' College should allocate time for preparation of teaching aids. Aids prepared should be used and the mathematics tutors themselves should make use of teaching aids during their lessons.

APPENDIX A

QUESTIONNAIRE 1

TUTORS' RESPONSES

You teach Mathematics in your College. Below are a few questions for you to answer. Your answer will provide information about some of the methods and instructional materials you use to teach Mathematics to your students.

You are asked to give a word or few words, dates, numbers or just a tick (✓) where applicable. It is hoped this exercise will be of value to all educators and your co-operation will be highly appreciated.

A. ABOUT THE TUTOR

1. Sex: Female ___ Male ___

2. Qualification: Grade C ___ Grade A ___

   Diplome ___ Graduate ___

3. Teaching experience in years 0 - 2 —, 3 - 5 —, > 5 —

4. Teaching experience in Colleges in years 0 - 2 —, 3 - 5 —, > 5

5. Your subject speciality: ___

B. INSTRUCTIONAL MATERIALS AND TEACHING AIDS

1. Is there a prescribed textbook on Mathematics

YES	NO

2. Do you use any reference books?

YES	NO

3. If yes, write the titles of those reference Mathematics books.

   a. ___

   b. ___

   c. ___

4. If yes, which of the reference books do you prefer much?

   a. ___

   b. ___

5. Indicate the reason for your preference of the books chosen in number (4) above.

___

___

___

6. Are students thoroughly familiarized with Primary School Mathematics Textbooks during the course?

YES	NO

7. Mention any topics you think could be dropped from the existing mathematics programme in Colleges.

a. _____

b. _____

c. _____

d. _____

8. Suggest any topics which you think should be included in the Mathematics Course in Colleges.

a. _____

b. _____

c. _____

d. _____

9. How much time in a week do you allot for teaching aids preparation?

_____

10. Do your students use the teaching aids they prepare?

YES	NO

11. If yes, when do they use these teaching aids?

a. _____

b. _____

c. _____

12. Do you train your students to utilize local materials or resources to prepare their teaching aids?

YES	NO

13. If yes, mention one instance.

_____

_____

_____

C. TUTORS' ATTITUDES TOWARDS MATHEMATICS

You are to express, on a five-point scale; the extent of agreement between the feelings expressed in each statement and your own personal feeling. The five points are: Strongly Disagree (SD); Disagree (D); Undecided (U); Agreed (A) and Strongly Agree (SA). Tick under ~~Circle~~ the letter (s) which best indicates how closely you agree or disagree with the feeling in each statement.

STATEMENT	SD	D	U	A	SA
1. The instructional materials in the Teacher-Education Curriculum in Primary Mathematics are appropriate.					
2. The Mathematics Course in Colleges should allot more time for familiarizing students with the contents of primary class textbooks.					
3. To build up more confidence in the student more periods on the College Timetable should be given to Mathematics.					
4. More emphasis should be given to mental sums.					

FOR NUMBERS 5 - 7 INDICATE YOUR PREFERENCE WITH ONE RESPONSE.

5. How would you rate your Grade C students in terms of their academic ability in College Mathematics?

   a. very poor _____
   b. poor _____
   c. average _____
   d. above average _____

6. How would you rate your Grade A students in terms of their academic ability in College Mathematics?

   a. very poor _____
   b. poor _____
   c. average _____
   d. above average _____

7. How would you rate the content of the existing Teachers' College Mathematics Syllabus?

a. very extensive for the 2-year period. _____

b. extensive for the 2-year period. _____

c. Good for the 2-year period _____

d. Very good for the 2-year period. _____

APPENDIX B

QUESTIONNAIRE 2

FOR TEACHER-TRAINEES' RESPONSES

Below are a few questions for you to answer. You are asked to give a few words, dates, numbers or just a tick (✓) where applicable. Most of the questions are about Mathematics.

A. ABOUT THE TEACHER-TRAINEE

1. Sex: Female _____ Male _____
2. Grade aspiring for: Grade A __ Grade C _____
3. Your subject speciality _____

B. INSTRUCTIONAL MATERIALS AND TEACHING AIDS

1. Is there a prescribed mathematics textbook in your College?

YES	NO

2. If yes, what is its title? And if no, what books do you use?

a. _____

b. _____

c. _____

3. Do you have any mathematics reference books?

YES	NO

4. If yes, write the titles of these books

a. _____

b. _____

c. _____

d. _____

5. Which of those reference books do you prefer much?

a. _____

b. _____

c. _____

6. Indicate the reason for your preference of the chosen books.

a. _____

b. _____

7. Are Primary School Mathematics Textbooks familiarized to the students during the course?

YES	NO

8. Write down any mathematics topics you think could be dropped from the existing mathematics programme in your College:

a. _____

b. _____

c. _____

d. _____

9. Suggest any mathematics topic which you think should be added in the mathematics course to make you a more competent teacher.

a. _____

b. _____

c. _____

d. _____

10. Are you given time in a week to prepare teaching aids in mathematics?

YES	NO

C. TEACHER-TRAINEES' ATTITUDE TEST

You are to express, on a five-point scale, the extent of agreement between the feelings expressed in each statement and your own personal feeling. The five points are:
Strongly Disagree (SD); Disagree (D); Undecided (U); Agree (A) and Strongly Agree (SA). Tick under ~~Circle~~ the letter (s) which best indicates how closely you agree or disagree with the feeling in each statement.

STATEMENT	SD	D	U	A	SA
1. Your College Mathematics Course broadens your knowledge beyong your Secondary or Primary School Mathematics					
2. You find College Mathematics Course preparing you more for Primary School Mathematics teaching (Methodology) than giving you academic background.					

STATEMENT	SD	D	U	A	SA
3. You find College Mathematics Course preparing you more both in mathodology and in broadening your academic knowledge for Primary School Mathematics teaching.					
4. After your two-year mathematics learning in the college you feel well prepared for teaching mathemetics in Primary Schools.					
5. Mathematics is your favourite subject in your College.					
6. The present College Mathematics Programme is too long for the 2-year training period.					

FOR NUMBERS 7 - 10 CHOOSE A WORD OUT OF THE FOUR GIVEN

7. Your overall performance in College Mathematics lessons and examination is

   a. poor _____.

   b. average _____

   c. good _____

   d. Very good _____

8. You find your mathematics lessons to be

   a. never interesting _____

   b. interesting _____

   c. often interesting _____

   d. usually interesting _____

9. The knowledge the mathematics tutor (s) has/have of the subject taught would be rated as:

   a. average _____

   b. good _____

   c. very good _____

   d. excellent _____

10. The general (all-round) teaching ability of the mathematics tutor (s) would be rated as

a. average _____

b. good _____

c. very good _____

d. excellent _____

APPENDIX C

QUESTIONNAIRE 3

SERVING TEACHERS' RESPONSES

You teach mathematics in your school. Below are a few questions for you to answer. You are asked to give a few words, dates, numbers or just a tick (✓) where applicable. We believe this exercise will be of value to all educators and your co-operation will be highly appreciated.

A. ABOUT THE TEACHER

1. Sex: Female _____ Male _____
2. Qualification: Grade C ___ Grade A _____
3. Teaching experience in years 0-2 ___; 3-5 ___; >5 ___
4. Teaching Mathematics experience in years 0-2 ___; 3-5 ___ >5 ___
5. Your subject speciality. _____

B. INSTRUCTIONAL MATERIALS AND TEACHING AIDS

1. Number of mathematics periods you have every week:

   a. 5 _____
   b. 6 _____
   c. 7 _____
   d. 8 and above _____

2. Are mathematics Textbooks available for the classes you teach?

YES	NO

3. If no, how do you go about teaching your classes?

_____

_____

_____

4. Do you find any difficulty in teaching your classes mathematics?

YES	NO

5. Do you have enough time to prepare your teaching aids in the subject?

YES	NO

6. If no, can you please explain the reason?

_____

_____

_____

7. Do you feel that the mathematics course you underwent in your Teachers' College is very useful in your teaching carrer?

YES	NO

8. If no, can you suggest how it can be made more useful?

_____

_____

_____

_____

9. Suggest mathematics topics you think would be very appropriate if included in the Mathematics course.

a. _____

b. _____

c. _____

d. _____

10. Suggest mathematics topics you think can be left out from the course without causing any harm.

_____

_____

_____

C. SERVING TEACHERS' ATTITUDES TOWARDS MATHEMATICS.

You are to express, on a five-point scale, the extent of agreement between the feelings expressed in each statement and your own personal feeling. The five points are: Strongly Disagree (SD); Disagree (D); Undecided (U); Agree (A) and strongly Agree (SA). Tick under ~~Circle~~ the letter (s) which best indicates how closely you agree or disagree with the feeling in each statement.

STATEMENT	SD	D	U	A	SA
1. Your College Mathematics Course broadened your knowledge beyond your Secondary or Primary School Mathematics					
2. You found College Mathematics Course preparing you more for primary school mathematics teaching (methodology) than giving you academic background.					
3. You found College Mathematics Course preparing you more both in methodology and in broadening your academic knowledge of Primary School Mathematics teaching.					
4. After your two-year mathematics learning in the college you felt well prepared for teaching mathematics in Primary Schools					
5. The existing College mathematics Syllabus is too long for the two-year training					
6. Mathematics was your favourite subject in your college.					

FOR NUMBERS 7 - 10 CHOOSE A WORD OUT OF THE FOUR GIVEN RESPONSES.

7. Your overall performance in College Mathematics lesson and examinations was:

   a. poor _____
   b. average _____
   c. good _____
   d. very good _____

8. You found your mathematics lessons to be

   a. never interesting _____
   b. rarely interesting _____
   c. often interesting _____
   d. usually interesting _____

9. The knowledge the mathematics tutors (s) has of the subject taught would be rated as:

   a. average _____
   b. good _____
   c. very good _____
   d. excellent _____

10. The general (all-round) teaching ability of the mathematics tutor (s) would be rated as::

   a. average _____
   b. good _____
   c. very good _____
   d. the best. _____

APPENDIX D

QUESTIONNAIRE 4

PRINCIPAL'S RESPONSES

This study is to survey the effectiveness of Teacher Education Curriculum in Primary School Mathematics. Please provide some information on the Primary mathematics Programme in your College.

Complete the following:

1. Name of the College - - - - - - -
2. Number of Mathematics Tutors in your College - - - - - -
3. Qualification of each Tutor and his subject speciality:
   i. Tutor I _____
   _____
   _____
   ii. Tutor II _____
   _____
   _____
   iii. Tutor III _____
   _____
   _____
4. The teaching load for those Tutors.
   Tutor I _____
   _____
   Tutor II _____
   _____
   Tutor III _____
   _____
5. Comment on whether you have enough mathematics Tutors.
   _____
   _____
   _____
   _____

6. What do you think are the most desirable qualities of a mathematics Tutor?

_____

_____

_____

7. Do you think the time (periods) allocated for mathematics teaching is adequate? Please briefly comment.

_____

_____

_____

8. Could you please comment briefly on the college syllabus content in relation to the two-year period available for training?

_____

_____

_____

9. Please give one or two suggestions on the improvement of mathematics teaching in Teachers' Colleges.

_____

_____

_____

10. Please give one or two suggestions on the topics that could be dropped or added to the existing syllabus.

_____

_____

_____

OBSERVATION SCHEDULE

The researcher will observe teachers teaching in the classroom. He will obtain information on:

(i) Pupil/teacher interaction during the lesson.

(ii) Teaching aids and teaching techniques which will include methods of teaching.

(iii) Pupils' assimilation of topics taught.

The researcher will use the following form by circling the grade written alongside each item which has to be observed. The grade to be selected should be that one which the researcher justifiably deems it to be in accordance with the points outlined under each item below this assessment form. Points should be selected before a numerical grade is awarded.

TABLE 16

Teaching Assessment Form

Item for Observation	Points against each Item	Grade
1. Lesson notes Plan	a, b, c, d, e	1, 2, 3, 4, 5
2. Knowledge of the Subject matter.	a, b, c, d, e	1, 2, 3, 4, 5
3. Ability to teach	a, b, c, d, e	1, 2, 3, 4, 5
4. Self-expression	a, b, c, d, e	1, 2, 3, 4, 5
5. Blackboard Work	a, b, c, d, e	1, 2, 3, 4, 5
6. Pupil/teacher relationship	a, b, c, d, e	1, 2, 3, 4, 5
7. Class discipline	a, b, c, d, e	1, 2, 3, 4, 5
8. Use of teaching aids	a, b, c, d, e	1, 2, 3, 4, 5
9. Pupils' assimilation of topic taught	a, b, c, d, e	1, 2, 3, 4, 5
10. Adequacy of given exercises	a, b, c, d, e	1, 2, 3, 4, 5

CRITERIA IN AWARDING GRADES

1. LESSON NOTES PREPARATION

The researcher will consider the following:

(a) Statement of the specific objectives for the lesson

(b) Teaching aids and their appropriateness

(c) Sequential and logical steps in the plan

(d) Relevance of introduction to new matter

(e) Good outlay of the plan.

2. KNOWLEDGE OF SUBJECT-MATTER

The researcher will look into:

(a) Teacher's mastery of the subject-matter

(b) Teacher's accuracy in presenting the topic intended for the lesson.

(c) Teacher's sticking to lesson specific objective

(d) Teacher's expression of what intended for the lesson.

(e) Teacher's vocabulary for the class.

3. ABILITY TO TEACH

The researcher will examine:

(a) Appropriateness of the methodology used.

(b) Proper use of the teaching methods.

(c) Ensurance to arriving at the specific objectives for the lesson

(d) Pupils' participation in the lesson.

(e) Adequate practice offered for mastery of topic taught.

4. TEACHER'S SELF-EPRESSION

The researcher will look into:

(a) Suitability of the vocabulary used.

(b) Proceeding from known to unknown.

(c) Audibility of the teacher's voice.

(d) Accuracy and preciseness in his expression.

(e) Confidence in what the teacher says.

5. BLACKBOARD WORK

The researcher will consider the following·

(a) Good handwriting on the Blackboard,

(b) Good arrangement of work on the blackboard.

(c) The teacher can draw things on the blackboard quickly and representably.

(d) The teacher's blackboard work is exemplorary.

(e) Unnecessary wiping out avoided.

6. PUPIL/TEACHER RELATIONSHIP

The researcher will observe whether:

(a) The teacher welcomes questions from the pupils.

(b) The teacher treats pupils' questions fairly.

(c) The teacher gives children chance to answer.

(d) Each child is given chance to answer questions.

(e) The teacher's questions are graded.

7. CLASS DISCIPLINE

The researcher will consider the following:

(a) Pupils listen intentively.

(b) Pupils are quiet but show interest.

(c) Very little time is wasted.

(d) Noise is easily controlled.

(e) More able children are attended too.

8. USE OF TEACHING AIDS

The researcher will consider the following:

(a) Teaching aids are appropriate.

(b) The teacher uses local materials.

(c) The teaching aids are properly prepared.

(d) The teaching aids during the lesson are properly used.

(e) Textbooks during the lesson are used.

9. PUPILS' ASSIMILATION

The researcher will see whether:

(a) The objective for the lesson is achieved

(b) The pupils can demonstrate easily what taught.

(c) Past exercises were done were done well.

(d) Corrections of missed sums are done.

(e) The teacher marks all exercises given.

10. ADEQUACY OF EXERCISES GIVEN

The researcher will consider the following:

(a) Given more than 50 exercises.

(b) All exercises given are marked

(c) All missed sums are corrected.

(d) Corrected sums are re-marked.

(e) Corrected sums are done neatly.

Key to awarding marks:

(a) Obtaining any 5 of items mentioned under each subheading will be awarded five marks

(b) Any 4, four marks

(c) Any 3, three marks

(d) Any 2, two marks

(e) Any 1, one marks.

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